USER MANUAL

uSign™
Signature Capture Module

Models uSign 100 & uSign 200

FCC WARNING STATEMENT
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

FCC COMPLIANCE STATEMENT
This device complies with Part 15 of the FCC Rules. Operation of this device is subject to the following conditions: this device may not cause harmful interference and this device must accept any interference received, including interference that may cause undesired operation.

CANADIAN DOC STATEMENT
This digital apparatus does not exceed the Class B limits for radio noise for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.
Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de las classe B prescrites dans le Réglement sur le brouillage radioélectrique édicté par les ministère des Communications du Canada.

CE STANDARDS
An independent laboratory performed testing for compliance to CE requirements. The unit under test was found compliant to Class B.

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ID TECH
10721 Walker Street
Cypress, CA 90630
(714) 761-6368
www.idtechproducts.com

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1.0   Introduction

The use of electronically captured signatures has become common for Point of Service (POS) applications. Electronic signature capture reduces transaction time, eliminates sorting & sending paper, provides convenient electronic storage & transmission, and gives legal accountability (non-repudiation) for POS transactions.

uSign™ is an electronic signature capture device with a back lighted graphic LCD display and touch sensitive screen that is the signature panel. Authors can view their signatures in real time during the signing process. Signatures are compressed and provided to a Host system for signature & data storage. The LCD display allows for interactive text, which supports pen-tap commands and function selections. The interactive Host operations allow selections and navigations through transactions with just the stylus.

The LCD & touch sensitive screen are surrounded in a plastic housing. The housing provides a tethered non-electronic stylus. The stylus is fastened to the housing in a way to allow stylus replacement. A mounting plate secures the uSign housing to a counter top or other mounting surface. An overlay covers and protects the signature area of the uSign display. The overlay is removable allowing replacement if the signature area becomes worn from stylus use. Customer specific front overlay designs are possible as needed by an application.

There are two major uSign housing configurations. The first is a signature pad enclosed in a stylish housing. This uSign is a POS System level product intended for signature capture at a transaction counter. A convenient palm rest area below the signature panel provides support during the signing process. The second configuration is an OEM version with a smaller housing and intended for mounting to a vertical or near vertical surface. Both products have the same internal components and operations.

2.0   Features

Electronic signature capture w Buffered signature capability
Sampling rate up to 190 dots per second
Real time signature capture with 5:1 compression
Raw data output available
Algorithms to filter spikes, provide Smoothing, & Calibration algorithms
Command & response driven operations through an API
Graphic display of signature during capture
Display graphics under Host control when not in signature process
Touch pad dot position matches LCD pixel locations
Operates with Windows 2000, XP, and Vista operating systems
Replaceable non-active tethered stylus
Resistive touch pad with transparent, replaceable protective overlay
The uSign 100 is UL listed; both uSign 100 & uSign 200 are RoHS compliant.

3.0   Model Designations

uSign 100   IDUA-01x100 *
uSign 200   IDUA-01x500 *

* The "x" defines the communication interface, 2 = RS232 and 6 = USB-CDC.

4.0   Terms & Abbreviations

COM   Host communication port
Host   Personal Computer, Terminal, or similar device
LCD   Liquid Crystal Display
LED   Light Emitting Diode
mA   Milli-Amperes of electrical current
RS232   Serial communications
USB   Universal Serial Bus, serial communications
VDC   Volts Direct Current

5.0   Installing uSign

uSign is designed for an indoor environment. Locate the uSign where it is convenient to operate and protected from heat or direct sunlight. Position the uSign so the signature pad area is easy to reach and the immediate area is clear for authoring the signature. The uSign housing has threaded inserts in the bottom and relief areas for hook & loop fasteners. A metal mounting bracket with keyhole & screw mounting is mounted to the back of the housing.

The uSign 100 with an RS232 interface uses a standard DB25 connector and is supplied power with a 9VDC power adaptor. The uSign 200 with an RS232 interface uses a standard DB9 connector and uses a 5VDC power adaptor. The input voltage on the power adaptors may be limited; do not exceed the input voltage rating of the power adaptor. Connect the power adaptor after the other connections are made. The uSign having a USB communication interface receives power from the host through the USB port.

For both interface types and when power is applied, the green & red LED on the uSign are on for a moment, go off, and then the green is on and flashing. If the LED does not light, check the connections and the availability of power from the power outlet. With the green LED flashing, the LCD screen displays: "IDTECH uSign, Version x.xx." When the signature screen is touched or commands are received from a Host, the LED is turned off and the screen is cleared for Host operations. The Green LED is controlled and is on when uSign is in the capture mode; the red LED is host controlled.

The communication type can be RS232 or USB-CDC. Use the Communication Interface section that corresponds with the interface of your uSign unit.

5.1   Communication Interfaces

RS232
The uSign has a communication cable with a DB25 (100 Model) or DB-9 (200 Model) connector that fits the computer serial (RS232) COM port connection. See the Specifications, Interface Section for COM port settings.

Connect the RS232 connector to the PC and insure it is fully seated into the connector. Connect the power adaptor output to the power input socket on the back of the DB connector shell. Connect the power adaptor to the AC line power outlet.

USB
The USB interface is a Communication Device Class that opens a virtual COM Port, which operates as though the COM was an RS232 device. The USB communication uses the Windows USB-CDC driver included in Windows 2000 & XP operating systems. ID TECH provides an INF file for use with the CDC driver. Note: Windows XP with Service Pack 1 can cause intermittent problems; use Service Pack 2.

Connect the USB connector to the PC and insure it is fully seated into the jack. If the LEDs do not light, check the connections and the availability of power from the Host.

When the USB connection is recognized by the operating system for the first time, a Found New Hardware message is given. The operating system must install the uSign INF setup file, {*uSignUsbCDC.inf*} for the system to communicate with the uSign. Retrieve the *uSignUsbCD*C.inf and companion *usbser.sys* files from the ID TECH website and save the files in a convenient location on the PC system.

The New Hardware Wizard window appears. Follow the directions and the wizard properly installs the INF setup information into the operating system. Select the "No, not this time" button and Click Next > to continue. Then select the "Install from a list or specific location (advanced)" button and Click Next > to continue.

Figure 1 New Hardware Wizard opening window

Browse and select the folder where the *uSignUsbCD*C.inf and companion *usbser.sys* files are located. Click Next > to continue.
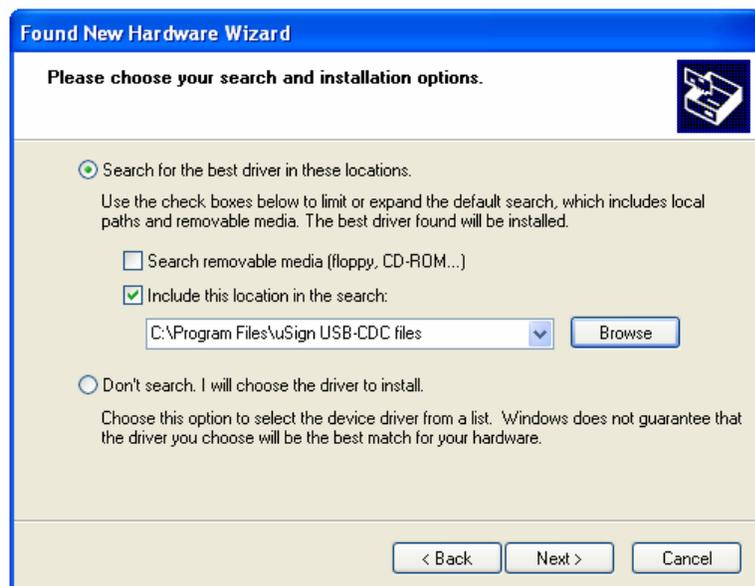

Figure 2 Browse for File

There is a warning window that the INF file is not registered; Click "Continue Anyway". Click Finish to complete the INF installation.
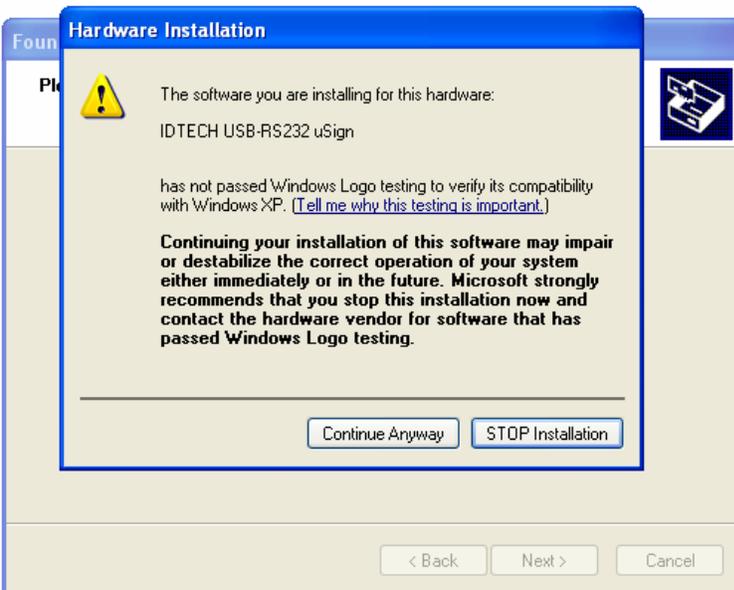

Figure 3   Installation Warning Message

5.2   USB-CDC Setup

The following steps provide a check on the USB-CDC COM port selected by the operating system. This step is used only if there is a need to confirm operation and possible to review the communication port number. Open the Windows Control Panel and follow the selections: System, Hardware Tab, and Device Manager. Expand the Port (COM & LPT) folder. There should be an item "IDTECH USB-RS232 uSign (COM #)", where # is a Port number. uSign is set-up and communicating.

6.0   Specifications

6.1   Power requirement

Voltage   uSign 100 is 9VDC and uSign 200 is 5VDC
Current   150mA typical
RS232 Power   AC adapter, center positive adaptor plug output
USB Power   Host USB port

6.2   Physical housing uSign 100

Overall size   113mm wide
                 77.5mm high
                 31.5mm thick including back plate
Display   3.3-inch diagonal signature area

6.3 Physical housing uSign 200

Overall size   129mm wide (5.1 in)
                       146mm length (5.75 in)
                       40mm thick including back plate (1.57 in)
Display   3.3-inch diagonal signature area

6.4 LCD screen & Resistive touch pad

Touchpad   Resistive, transparent, pressure-sensitive screen
Display   STN monochrome LCD
Sampling Rate   Up to 190 samples per second
Touchpad Resolution   up to 929 dpi
Display Resolution   LCD Resolution: 192 x 64 dots
Overlay Screen   Removable/Field replaceable signature surface

6.5 Communication interface

RS232
Baud rates   1200 to 115200
Default   9600 baud, data bits – 8, Parity – none, Stop bit – 1
USB   2.0 Full Speed (Common Device Class)

6.6 LED

Two individual LEDs (one green & one red)
Signature Pad or Host controlled

6.7 Agency Approvals

FCC Class B, & CE,
The uSign 100 is UL Listed
The product is RoHS compliant.

6.8 Electronics MTBF

Electronics MTBF   200,000 POH, based on Bellcore standard.

6.9 Electro-Static Discharges (ESD)

The electronics must survive ESD of 4kV contact, and 8kV air discharge. Meets or exceeds IEC 1000-4-2.

6.10 Environmental

Temperature ranges
      Operating   1 to 45 C   (34 to 113 F)
      Storage (sealed container) -10 to 70 C   (14 to 158 F)
Relative humidity

10% to 95% non-condensing

7.0   uSign commands description

(Version: 0.02 Date: 2007-03-19) Note: digits are given in little-endian format.

7.1   Command protocol:

Host to device: STX LenL LenH CommandData Lrc1 Lrc2 ETX

       STX: 0x02. 1 byte.
       LenL+LenH: sizeof(CommandData). 2 bytes.
       CommandData: main command string. Several bytes needed.
       Lrc1: Exclusive or of CommandData. 1 byte.
       Lrc2: Sum of CommandData. 1 byte.
       ETX: 0x03. 1 byte.

Device to Host: STX LenL LenH ResponseData Lrc1 Lrc2 ETX

       STX: 0x02. 1 byte.
       LenL+LenH: sizeof(ResponseData). 2 bytes.
       ResponseData: main response string. Several bytes needed.
       Lrc1: Exclusive or of ResponseData. 1 byte.
       Lrc2: Sum of ResponseData. 1 byte.
       ETX: 0x03. 1 byte

7.2   System Commands

7.2.1   Get firmware version

Command string: 78 01
Response string: IDTECH-USIGN V0.02

7.2.2   Get serial number

Command string: 78 02
Response string: Serial number

7.2.3   Get clip area

Command string: 7A 04 01
Response string: Clip area data (8 bytes)
Clip area is a rectangle coded as: left (2 bytes) + top (2 bytes) + right (2 bytes) + bottom (2 bytes)

7.2.4   Set clip area

Command string: 7A 04 02 Clip area data(8 bytes)
Response string: 0xE0

7.2.5   Clear clip area

Command string: 7A 08
Response string: 0xE0

7.3   One byte commands

7.3.1   Stop Capturing
Command string: C0
Response string: C0

7.3.2   Start Capturing use FBP format 1
Command string: C1
Response string: C1

7.3.3   Start Capturing use FBP format 2
Command string: C2
Response string: C2

7.3.4   Turn red led on
Command string: C3
Response string: C3

7.3.5   Turn red led off
Command string: C4
Response string: C4

7.3.6   Clear CMP format mode data
Command string: C5
Response string: C5

7.3.7   Get data 0x00
Command string: C6 or D4 or D5
Response string: 00

7.3.8   Start Capturing use CMP format
Command string: C7
Response string: C7

7.3.9   Reset points counter
Command string: D0
Response string: D0

7.3.10   Get point counter high byte
Command string: D1
Response string: D1

7.3.11   Get point counter low byte
Command string: D2
Response string: D2

7.3.12   Start Capturing use FBP format 0

Command string: D6
Response string: D6

7.4   Multi-byte commands

7.4.1   Initialize device

Command string: 28 10 00 00
Response string: DC 05

7.4.2   Get PW120 Version

Command string: 2A 10 00 00
Response string: 01 00

7.4.3   Test device

Command string: 52 12 00 00
Response string: 52 12

7.4.4   Set CTS control

Command string: 22 15 01 00 01(enable)/00(disable)
Response string: 01

7.4.5   Set interval between two points

Command string: 28 15 01 00 xx
Response string: 01

7.4.6   Get data 0x00 0x01

Command string: 2A 15 00 00
Response string: 00 01

7.4.7   Calibrate the device

Command string: 30 15 00 00
Response string: 01

7.4.8   Set offset position

Command string: 31 15 04 00 xx xx xx xx(offset point)
Response string: 01

7.4.9   Get data 0x01

Command string: 32 15 00 00
Response string: 01

7.4.10   Offset using control

Command string: 34 15 01 00 01(enable)/00(disable)
Response string: 01

7.4.11   Stop Capturing

Command string: 40 30 00 00
Response string:

7.4.12   Start Capturing use FBP format 1

Command string: 41 30 00 00
Response string:

7.4.13   Clear display screen

Command string: 40 32 00 00
Response string:

7.4.14   Draw line

Command string: 43 32 08 00 X1(2 bytes) Y1(2 bytes) X2(2 bytes) Y2(2 bytes)
Response string:
Line is defined by two points: (x1,y1) --- (x2,y2)

7.4.15   Draw hollow rectangle

Command string: 50 32 08 00 Left(2 bytes) Top(2 bytes) Right(2 bytes) Bottom(2 bytes)
Response string:

7.4.16   Draw solid rectangle

Command string: 51 32 08 00 Left(2 bytes) Top(2 bytes) Right(2 bytes) Bottom(2 bytes)
Response string:

7.4.17   Draw text

Command string: 80 32 (String Length+6) 00 X position(2 bytes) Y position(2 bytes)
String Length(2 bytes) String
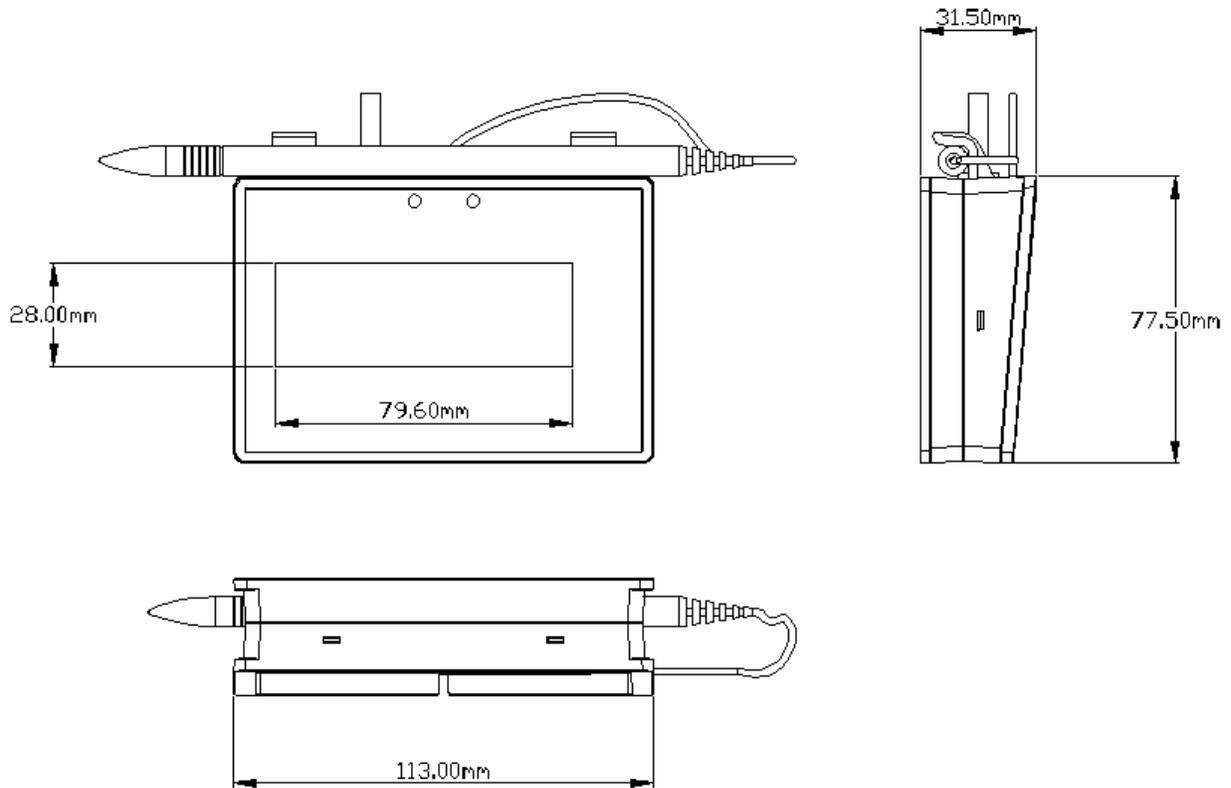Response string:

uSign™ 100 SIGNATURE CAPTURE PAD

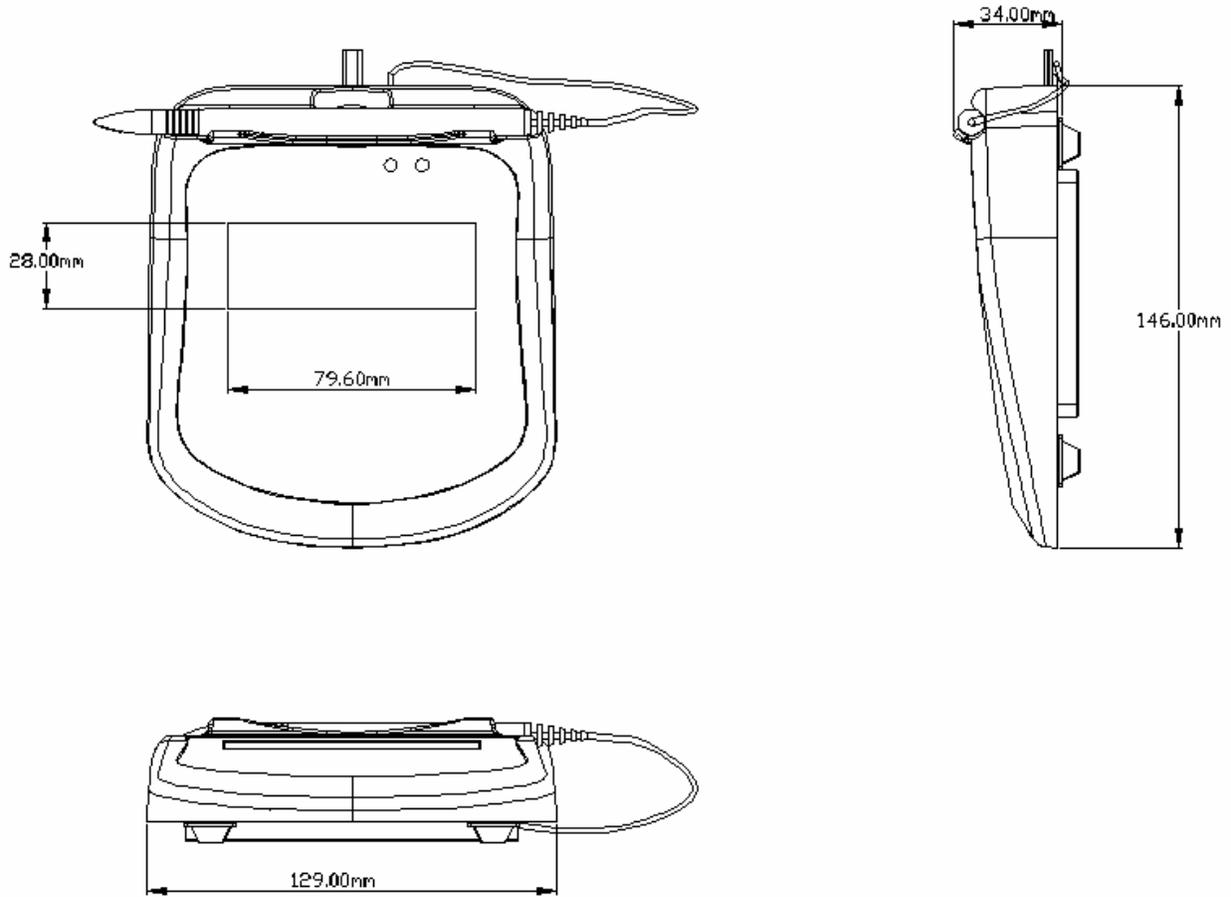**Figure 4   Outline Drawing for uSign 100**

uSign™ 200 SIGNATURE CAPTURE PAD

Figure 5   Outline Drawing for uSign 200